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Are Clinical, Laboratory, and Imaging Markers Suitable Predictors of Vesicoureteral Reflux in Children With Their First Febrile Urinary Tract Infection?

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Purpose: This study was conducted to determine the predictive value of clinical, laboratory, and imaging variables for the diagnosis of vesicoureteral reflux in children with their first febrile urinary tract infection.

Materials and Methods: One hundred fifty-three children with their first febrile urinary tract infection were divided into two groups according to the results of voiding cystourethrography: 60 children with vesicoureteral reflux and 93 children without. The sensitivity, specificity, positive and negative predictive value, likelihood ratio (positive and negative), and accuracy of the clinical, laboratory, and imaging variables for the diagnosis of vesicoureteral reflux were determined.

Results: Of the 153 children with febrile urinary tract infection, 60 patients (39.2%) had vesicoureteral reflux. There were significant differences between the two groups regarding fever＞38°C, suprapubic pain, C-reactive protein quantitative level, number of red blood cells in the urine, and results of renal ultrasound and dimercaptosuccinic acid renal scanning ($p<0.05$). There were significant positive correlations between fever＞38.2°C and dimercaptosuccinic acid renal scanning and vesicoureteral reflux. Also, there were significant positive correlations between the erythrocyte sedimentation rate, positive urinary nitrite test, hyaline cast, and renal ultrasound and high-grade vesicoureteral reflux.

Conclusions: This study revealed fever＞38.2°C and dimercaptosuccinic acid renal scanning as the best predictive markers for vesicoureteral reflux in children with their first febrile urinary tract infection. In addition, erythrocyte sedimentation rate, positive urinary nitrite test, hyaline cast, and renal ultrasound are the best predictive markers for high-grade vesicoureteral reflux.

Keywords: ^{99m}Tc-Dimercaptosuccinic acid scan; Sedimentation rate; Urinary tract infections; Vesicoureteral reflux

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INTRODUCTION

Urinary tract infection (UTI) is a common disease in children [1]. The prevalence of UTI in males and females is 2% and 7%–8%, respectively [2]. UTI includes acute pyelonephritis, lower UTI, and asymptomatic bacteriuria. Acute pyelonephritis is the most severe type of the disease [1-3]. Serious complications, such as renal scarring, hypertension, and chronic renal failure can result following a delay in diagnosis and treatment. In addition, failure to detect risk factors may aggravate complications [4-7]. The prevalence of renal scarring following febrile UTI has been reported as 10% to 65% [8]. Risk factors, including sex, not being circumcised, constipation, and vesicoureteral reflux